What is claimed is:

1. An isolated and purified polypeptide having β3-adrenergic receptor activity comprising the amino acid sequence of Figure 3. (SEQ ID NO:5)

2. An isolated and purified polypeptide having β3-adrenergic receptor activity comprising the amino acid sequence of Figure 4. (SEQ ID NO:6)

3. An isolated and purified nucleic acid sequence comprising the nucleotide sequence of Figure 1 encoding for a β3-adrenergic receptor.

4. An isolated and purified nucleic acid sequence comprising the nucleotide sequence of Figure 2 encoding for a β3-adrenergic receptor.

5. An isolated and purified nucleic acid sequence containing the intron sequences set forth in Figures 1 or 2.

6. A recombinant vector for cloning or expression, said vector selected from the group consisting of a plasmid, cosmid and phage comprising the nucleotide sequence according to Claim 3 or 4.

7. A recombinant vector according to Claim 6, comprising at one of its sites not essential for its replication elements necessary to promote the expression of one of the amino acid sequences according to Claim 1 or 2 in a cell host.

8. A cell host transformed by a recombinant vector according to any one of Claims 5 to 7 which comprises the elements of regulation allowing expression of the

nucleotide sequence encoding the polypeptide according to Claim 1 or 2 in this host.

9. A transformed host cell according to Claim 8, wherein said host cell is a procaryotic or an eukaryotic cell.

10. The transformed host cell according to Claim 9, wherein said cell is E. coli, or CHO cells or L cells.

11. An antibody directed against the polypeptide of Claim 1 or 2.

12. A nucleotide probe containing the nucleotide sequence according to any one of Claims 3, 4, or 5.

13. The nucleotide probe of Claim 12, wherein said probe is capable of hybridizing with a complementary sequence under conditions of hybridization such that it does not hybridize with the genes or messenger RNA of the β1- or β2-adrenergic receptors.

14. A process for the preparation of the polypeptide according to Claim 1 or 2, comprising the steps of:

(a) transforming a host cell with a recombinant vector containing the nucleic acid sequences of Claim 3 or 4;

(b) culturing said transformed host cell in a culture medium; and

(c) recovering said polypeptide produced by the cells.

15. A procedure to detect the binding of a chemical agent to a polypeptide according to Claim 1 or 2 comprising the steps of:

(a) placing said chemical agent in contact with a cell host transformed by a vector containing a nucleotide sequence encoding the polypeptide of the β3-adrenergic receptor, wherein said cell host contains at its surface one or more sites specific for the polypeptide under conditions allowing the formation of a bond between at least one of these specific sites and the chemical agent; and

(b) detecting the possible formation of a complex between said chemical agent and polypeptide.

16. A procedure to study the affinity of a polypeptide according to Claim 1 or 2 for at least one specific ligand comprising the steps of:

(a) transforming a cell host with a vector in which a nucleotide sequence encoding the β3-adrenergic receptor has been inserted under control of a promoter recognized by the polymerases of the cell host and which allows the expression of said nucleotide sequence;

(b) culturing the transformed cell host under conditions which allow the expression of the insert and the transport of the β3-adrenergic receptor at the membrane such that the transmembrane sequences are exposed at the surface of the transformed cell host;

(c) placing in contact of the cultured cell host in (b) with specific ligands; and

(d) detecting an affinity reaction between the transformed cell host and said specific ligands.

17. Nucleotide probes used to detect functional abnormalities in the β3-adrenergic receptor gene.

18. A nucleotide probe according to Claim 12, wherein said probe is used to detect functional abnormalities in the β3-adrenergic receptor sequence.

19. A method for detecting functional abnormalities of β3-adrenergic receptor sequences comprising the steps of:

(a) hybridizing a nucleotide sequence coding for a β3-adrenergic receptor with the nucleotide probe of Claim 12; and

(b) detecting the abnormality of the sequence.